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Robert Martinson

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EXAMINER

BAND, MICHAEL A

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ROBERT MARTINSON,  
NORMAN BOURDON, KWOK FAI LAI,  
DHAIRYA SHRIVASTAVA,  
and PAUL SHUFFLEBOTHAN

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Appeal 2009-003059  
Application 10/823,355  
Technology Center 1700

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Decided: September 25, 2009

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Before BRADLEY R. GARRIS, ADRIENE LEPIANE HANLON, and  
BEVERLY A. FRANKLIN, *Administrative Patent Judges*.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from an Examiner's decision rejecting claims 1-11 and 13-20 under 35 U.S.C. § 102(b) as anticipated by

Chung or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Chung.<sup>1</sup> We have jurisdiction under 35 U.S.C. § 6(b). We REVERSE.

The subject matter on appeal is directed to a shielding system for a physical vapor deposition chamber. Claims 1, 14, and 20 are the independent claims on appeal.

Claim 1 reads as follows.

1. A shielding system for a physical vapor deposition chamber, the chamber having a pedestal movable between a lowered loading and unloading position and a raised deposition processing position and surrounded by chamber interior lower, side and upper walls, the chamber further including a sputter target above the pedestal, the shielding system comprising:

a pedestal shield attachable to the pedestal and movable therewith between the lowered and raised positions, the pedestal shield surrounding and extending outward from the pedestal toward the chamber side or lower walls; and

a sidewall shield adapted to extend substantially around and within the chamber sidewalls, and downward from an upper portion thereof, the sidewall shield having a lower end extending inward and disposed adjacent the pedestal shield upper portion when the pedestal is in the raised position, the sidewall shield lower end being above the pedestal, when the pedestal is in the lowered position, a distance sufficient to permit a wafer to be horizontally loaded onto the pedestal,

*the pedestal shield and sidewall shield cooperating, when the pedestal is in the raised position, to prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber.*

App. Br. 16, Claims Appendix (emphasis added).<sup>2</sup>

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<sup>1</sup> US 6,171,453 B1 to Chung issued January 9, 2001.

<sup>2</sup> Appeal Brief dated December 11, 2007.

Similarly, claim 14 recites:

. . . the pedestal shield and sidewall shield cooperating, when the pedestal is in the raised position, to prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber . . . .

App. Br. 20, Claims Appendix.

Claim 20 recites a method of shielding a physical vapor deposition chamber comprising the step of:

. . . moving the pedestal to the raised position, the pedestal shield and sidewall shield cooperating to prevent line-of-sight or gas-scattered transmission of deposition from the sputter target to the side and lower walls of the deposition chamber.

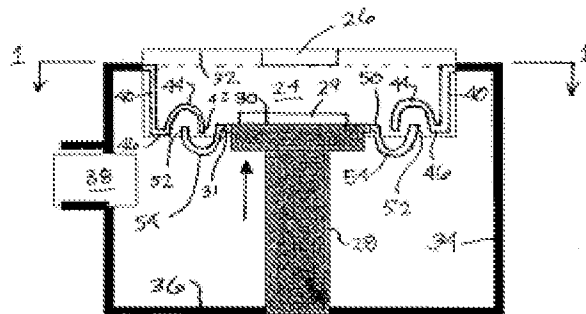
App. Br. 22-23, Claims Appendix.

## B. ISSUES

Have the Appellants shown reversible error in the Examiner's position that Chung describes or renders obvious a pedestal shield and a sidewall shield that cooperate to prevent line-of-sight or gas-scattered deposition transmission as recited in claims 1, 14, and 20?

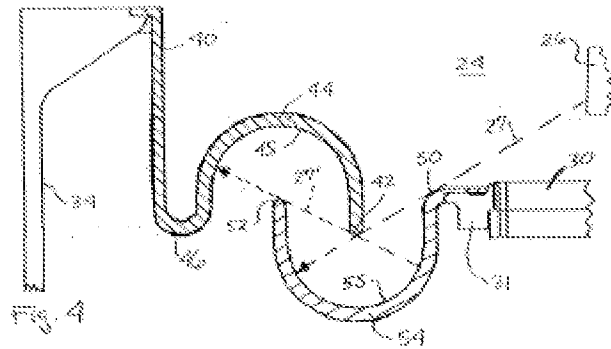
## C. FINDINGS OF FACT

The Appellants' Figure 3, reproduced below, illustrates an embodiment of the invention with the pedestal in the raised position. Spec., para. [0025].



Appellants' Figure 3 depicts the shield system mounted in a physical vapor deposition chamber.

The Appellants' Figure 4, reproduced below, illustrates the interlocking sidewall and pedestal shields of the Appellants' Figure 3. Spec., para. [0026].



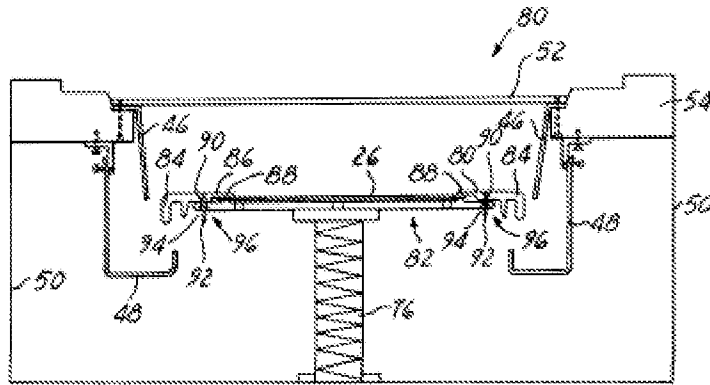
Appellants' Figure 4 is a close-up view of the shield system.

According to the Appellants, the interlocking sidewall and pedestal shields illustrated in Figure 4 prevent

line-of-sight transmission of deposition from target 26 to the chamber sidewalls 34, as shown by ray 27 hitting the upward facing side 55 of the pedestal shield [and] secondary gas-scatter ray transmission from the pedestal shield to the chamber sidewalls as shown by secondary ray 27' emitted from the upwardly facing side 55 of the pedestal shield and hitting the lower facing side 45 of the sidewall shield.

Spec., para. [0047].

Chung's Figure 6B, reproduced below, illustrates a physical vapor deposition chamber with the pedestal 82 in the raised or process position. Chung 5:62-64.



Chung's Figure 6B depicts a cross-sectional view of a physical vapor deposition chamber.

The Examiner found that the chamber includes a pedestal shield 84 and an upper chamber shield 46. Ans. 3.<sup>3</sup>

The Examiner found that the pedestal shield 84 surrounds and extends outward from the pedestal 82. Ans. 3.

The Examiner found that the chamber shield 46 extends downwardly from an upper portion, and a lower portion of the shield 46 extends inwardly. When the pedestal is raised, the lower end of the shield 46 is adjacent to the pedestal shield 84, and when the pedestal is lowered, the lower end of the shield 46 is above the pedestal. Ans. 3.

The Examiner also found that the chamber includes a lower chamber shield 48. Ans. 3.

#### D. PRINCIPLES OF LAW

“To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.” *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1977).

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<sup>3</sup> Examiner's Answer dated February 11, 2008.

A claimed invention is not patentable if the subject matter of the invention would have been obvious to a person having ordinary skill in the art at the time the invention was made. 35 U.S.C. § 103(a); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 405 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 13 (1966).

“[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

#### D. ANALYSIS

The Appellants argue:

. . . Chung’s upper chamber shield 46 . . . does not meet the limitations of the “sidewall shield” of claims 1, 14 and 20. As stated in those claims, the pedestal shield and sidewall shield cooperate, when the pedestal is in the raised position, to prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber. When in the raised position (Figs. 3B, 5B and 6B), there is clearly line of sight transmission between the pedestal and upper chamber shield 46 to the side and lower walls of the deposition chamber.

App. Br. 12. Indeed, Chung’s Figure 6B shows that when the pedestal is in the raised position, there is a space between the pedestal shield 84 and the upper chamber shield 46. *Compare* Appellants’ Fig. 4.

In response, the Examiner finds that in the raised position, the pedestal shield 84 and the *lower* chamber shield 48 cooperate to block “unwanted deposition particles from reaching the walls and the floor of the deposition chamber.” Ans. 7. However, the Examiner found that the upper chamber shield 46, not the lower chamber shield 48, corresponds to the sidewall shield recited in claims 1, 14, and 20. *See* Ans. 3. Thus, it is of no moment in the rejection before us that the pedestal shield 84 and the lower

chamber shield 48 may cooperate to block unwanted deposition particles. The issue on appeal is whether the pedestal shield 84 and the *upper* chamber shield 46 cooperate as recited in claims 1, 14, and 20.

On the record before us, the Examiner did not find that the pedestal shield 84 and the upper chamber shield 46 cooperate, when the pedestal is in the raised position, to prevent line-of-sight or gas-scattered deposition transmission from the sputter target to the side and lower walls of the deposition chamber. *See* claims 1, 14, and 20. The Examiner has also failed to establish that such cooperation between the pedestal shield 84 and the upper chamber shield 46 would have been obvious to one of ordinary skill in the art in view of the teachings of Chung. Therefore, we cannot sustain the rejections of claims 1-11 and 13-20 before us.

E. DECISION

The decision of the Examiner is reversed.

REVERSED

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